

KIDS AND CREEKS: RESTORATION ECOLOGY IN ACTION
AFRP proposal, August 1999

1. Scope of the project

This is a project of Streaminders Hands-On Environmental Education, a local program of the Izaak Walton League of America that presently includes more than thirty-five classrooms in Butte County. Streaminders has sponsored comprehensive riparian education programs for area schools since the fall of 1986, integrating basic ecology principles with the life cycle and habitat needs of salmonid species through four focus areas: 1) teacher inservice workshops; 2) raising salmon and steelhead from eyed eggs to fry in refrigerated classroom aquaria; 3) creek ecology exploration; and 4) habitat restoration. Kids And Creeks: Restoration Ecology In Action is the restoration component of the Streaminders education program, available to students grades 2 - 12 from Chico, Oroville, Paradise and Durham School Districts. Dr. Paul Maslin, Professor of Biology at California State University, Chico (CSU, Chico) will serve as Principal Investigator and the CSU, Chico Research Foundation will serve as fiscal agent. This project has the approval and support of Julie Brown, the Department of Fish and Game representative for the Butte County area.

The current proposal is for funding to continue Kids And Creeks: Restoration Ecology In Action. This is an in-depth restoration ecology action project, involving 30 classrooms whose teachers consider this an integral part of their science curriculum. This proposal is designed to fund fifteen of the 30 classrooms. Funding for the rest is being sought elsewhere. If only one proposal is funded, the project will go with only 15 classrooms. With this proposal, approximately 420 students, 15 teachers, 30 teacher aides/student teachers, 50 parents and 10 community volunteers will gain appreciation of local riparian systems, a knowledge base regarding the intricacies of riparian ecology, and a lifelong commitment to care of local waterways and the rich systems of life that they support. Approximately 80,000 square feet of riparian land on Big Chico Creek, Butte Creek and the Feather River will be enhanced by removal of encroaching exotic plant species and planting of appropriate native trees, grasses and shrubs. The Streaminders restoration team will guide students, teachers and parents in carrying out this work. The project includes the following activities for all participating classes:

A. Classroom presentations link the restoration work that the students will be conducting with basic ecology concepts exemplified by the life cycle and habitat needs of local anadromous salmonid species. Presentation themes include a detailed description of the tasks involved with the restoration project, including planting techniques and tool safety. Also covered in the presentation are the importance of biodiversity, the value of native plants to healthy ecosystems, and the danger to the habitat of encroachment by exotic plant species.

B. Restoration field trips begin with an Aecosystem discovery hike@ where students are guided to observe and discover stream flow dynamics and examples of healthy and unhealthy qualities of the riparian ecosystem, including native plant diversity and exotic encroachment. Next, students and their teachers, guided by trained group leaders, use hand tools to remove invasive exotic plants and replant with site-appropriate native plants. Some plantings are done at bank-full level and top of bank to enhance bank stability. Other plantings are placed inland to fill in where exotics were removed or where human impact has caused bare ground areas. Planting techniques and tool safety are reinforced by on-site demonstration and coaching. Planting materials may include materials previously gathered by the students on location and started in their classrooms, such as valley oaks or buckeye from acorns and buckeye, or rooted cuttings taken from willows, elderberries and cottonwoods. Some plant materials will be donated by members of the Native Plant Society, or by the entities having jurisdiction over the sites on which the restoration is to take place. Some plants will be purchased

from a local native plant nursery. Some cuttings will be taken on site the day of the restoration field trip. Final tasks include watering, mulching and site clean-up. The field trip closes with a circle of appreciation.

C. Site maintenance field trips are a follow-up to the restoration work. These field trips are designed to begin the monitoring and maintenance process at the site while serving as a catalyst to instill a sense of long-term ownership, responsibility and stewardship. Students weed, water and mulch the new plantings, and observe the changes in their site since the last visit. Besides the excitement of seeing the growth and changes at the site, students learn that they can't just put something in the ground and walk away from it, but that plants need care to grow. This builds understanding of the necessity for nurturance as central to stewardship, and teaches the requisite follow-through skills. Students and their families are invited to participate in site maintenance through the ensuing dry months.

RESTORATION SITE DESCRIPTIONS

All restoration sites are publicly owned, serving as the grounds of a state-run agency, public parks or designated ecological preserves. Restoration tasks include removal of invasive exotic species such as Himalayan blackberry, periwinkle, English ivy and star thistle and re-planting with appropriate diverse native species such as valley oak, buckeye, elderberry, spice bush, willow, alder, cottonwood, California sycamore, button willow, Santa Barbara sedge, deer grass and other native grasses. Although a little soil may be mobilized if storm events occur immediately after restoration activities, negative environmental impact should be minimal, short-lived, and far out-weighted by long-term beneficial results. There are no title restrictions or encumbrances that would adversely affect the proposed use.

On Big Chico Creek, an area known as Annie's Glen is the main focus of our attention. This site, a narrow strip approximately 600 feet by 70 feet located in Bidwell Municipal Park in downtown Chico, was over-run by Himalayan blackberries until 1998 when the City of Chico Parks Department arranged for the berries to be cut back. In the winter of 1999, led by Streaminders, five classroom groups and one community group removed the blackberry roots and replanted with natives, developing the beginnings of a beautiful native plant garden and enhancing the riparian corridor. Annie's Glen needs additional blackberry removal and revegetation with natives and continued weeding to prevent the blackberries from re-encroaching.

On Butte Creek, there are two sites:

- 1) The Honey Run Unit of the Butte Creek Ecological Preserve is a 96-acre parcel in Butte Creek Canyon with 4000 feet of streambank. Title is held by the Watershed Project of the CSU, Chico Research Foundation. Historically this land was the site of dredge mining, and inland many tailings with encroaching starthistle remain. However, the streambank is vegetated, except for some areas of erosion from recent floods. Restoration tasks include star thistle removal and revegetation of the eroded bank with cottonwoods, willows, alders and sycamores.
- 2) The Keeney Ranch Unit of the Butte Creek Ecological Preserve is a 56-acre parcel of former agricultural land in Durham under title to the Center for Natural Lands Management. Restoration tasks will include removal of Johnson grass, starthistle and other exotic forbs, and revegetation with mixed riparian trees including willow, sycamore, valley oak, Oregon ash and box elder.

On the Feather River there are two sites:

- 1) The Feather River Fish Hatchery is located on the south bank of the Feather River, near downtown Oroville. The California Department of Fish and Game operates the Hatchery on land leased from the

Department of Water Resources. The restoration site on the hatchery grounds is, for the most part, rocky, barren and infested with star thistle. Restoration tasks will be to remove star thistle, replant with native grasses, shrubs and trees, and do a concerted maintenance effort to keep the thistle population down until the native plants take hold. In this area, a landscaping plan is appropriate, with use of attractively arranged native grasses, flowering shrubs and trees, to benefit not only wildlife habitat, but also to enhance the appearance of the Hatchery grounds and educate visitors to the Hatchery. 2) The Feather River Nature Center, directly across the river from the Hatchery, was once over-run by Himalayan blackberries and human trash. It has been transformed into a beautiful native plant park and nature museum by a dedicated group of citizen volunteers, with City of Oroville approval. Restoration tasks will be to continue maintenance of replanted areas, including monitoring for encroaching blackberries and periwinkle, and to continue native revegetation.

EDUCATIONAL VALUE OF PROJECT

A primary purpose of the Restoration Ecology in Action project is to teach students and their teachers about the value of healthy riparian ecosystems, and to encourage a stewardship ethic through direct involvement with restoring and enhancing local riparian habitat in areas damaged by human abuse. This ties in with the curriculum theme in the other Streaminders program areas focusing on the life cycle and habitat needs of locally threatened and endangered species of Chinook salmon and steelhead trout, and the importance of protection of habitat for their survival. The goal is for students, their teachers and families, to develop a lifelong commitment to environmental stewardship.

Learning about ecology requires hands-on experience. Environmental education research has shown that in order for children to develop positive environmental attitudes and behaviors, students need early and constant exposure to the natural environment through environmental education activities. While on field trips, students have the opportunity to apply critical thinking, problem solving and decision making skills that they have been learning in class to real world experience. Our local streams provide fascinating environments for youth to learn about salmonid life cycles, stream ecology and restoration ecology.

Salmon and steelhead are environmental indicators of the health of a stream ecosystem. Using their habitat and life cycle needs as a focal point lays the foundation for systematic, holistic watershed education. The hands-on approach of this project introduces to classroom teachers an effective tool for building awareness of environmental issues and the skills to create solutions. Incorporating two tiers of students within the community - from the university and from the local school districts - enriches the educational experience for all participants.

The geography of this region, replete with two rivers and numerous creeks makes this an exceptionally appropriate location for hands-on riparian education. The Butte County area, located in the foothills of Northern California, has two of the five remaining California streams (Big Chico and Butte Creeks) that support Spring-run Chinook salmon. Other streams in the area that provide important anadromous fish habitat include Lindo Channel, Mud Creek, Rock Creek, the Feather River and the Sacramento River. Being involved in improving habitat for particular threatened and endangered species that they have become very familiar with adds weight to the students' experience. Involvement in the process gives them a significant sense of ownership, empowerment and civic pride. Such experience instills hope that the environmental challenges of our times can be met, thereby stimulating continuing stewardship.

PRIMARY PROJECT PARTNERS

Research Foundation, CSU, Chico

Watershed Project, Research Foundation, CSU Chico

Center for Natural Lands Management, CSU, Chico

Feather River Hatchery, California Department of Fish and Game

Feather River Nature Center

City of Chico Parks Department

AmeriCorps Watershed Project

POTENTIAL OR KNOWN FUNDING SOURCES

Known: Environmental Protection Agency - funds the three other components of the Streaminders

Hands-on Environmental Education program: teacher inservice workshop, salmonids the classroom, and creek ecology field trips.

Potential: The Wildlife Conservation Board of the California Department of Fish and Game, the Department of Fish and Game Watershed Restoration Branch, the Butte County Fish and Game Commission, the California Native Plant Society, Bureau of Land Management .

2. Benefits of the project

This project has ecological and educational objectives and benefits. The main ecological objective is removal of encroaching exotic plant species and revegetation with appropriate native trees, grasses and shrubs on approximately 80,000 square feet of riparian lands on Big Chico Creek, Butte Creek and the Feather River. This will enhance habitat for spring run Chinook and steelhead spawning and rearing. Other species that will benefit from the project include fall-run Chinook salmon, native non-game fish and the entire array of riparian-dependent fauna and flora native to this mid-California valley ecosystem. Native riparian plants support many native herbivorous insects that potentially fall into the water providing food for rearing salmon and other fish. Exotic plants, by contrast, produce little in the way of fish food. Revegetation with natives also provides required shade for cooler water temperatures, and fish cover from overhanging branches and the complex root structures along streambanks.

The educational objectives are to involve approximately 420 students, grades 2 through 12, from 15 classrooms in Butte County schools in a hands-on educational experience. Students will learn by doing to understand the dynamics and interactions of local riparian ecosystems and the significance of habitat loss as a threat to survival for important plant and animal species. Students also experience being active participants in the effort to conserve and restore local riparian systems and other natural areas. Additional benefits to participants include life enrichment from experiencing a direct link with the beauty and wonder of nature, and the satisfaction of learning techniques to help nurture the habitat upon which ultimately all life, including theirs, depends.

The proposed project is in compliance with the directives of the existing adaptive management plan for Butte Creek. The management plan for Big Chico Creek is in process of being developed. To our knowledge, there is no adaptive management plan for the Feather River. -

3. Monitoring and data evaluation

Planned monitoring and data evaluation will be in the form of photographic records taken at each site before work begins and annually from the same location. We may photo-document sites after major weather events. Also, we will invite peer review for evaluation of the project by local professionals in the field of riparian restoration through examination of our photo series and on site assessment.

4. Work to be performed and deliverables

Tasks By Date

APRIL - JULY, 2000:

- Administration
- Recruit and train Restoration Coordinator
- Develop specific planting plan for each site
- Plant procurement
- Tool inventory

August, September 2000:

- Administration
- Develop grade-level appropriate classroom presentations
- Schedule classroom presentations and restoration field trips with participating teachers
- Recruit college student to serve as group leaders and interns
- Group leader training

November 2000 - April 2001:

- Administration
- Give classroom presentations to prepare students for restoration
- Restoration field trips / staff coordination.

May - June 2001:

- Administration
- Site-monitoring field trips
- Send out evaluation forms to participating teachers
- Write year-end report

July - October 2001:

- Administration
- Monitor restoration sites through the summer: water, mulch, weed
- Write final report

5. Budget

Budget by Task

Project Phase and Task	Direct Labor Hours	Direct Salary and Benefits	Overhead Labor (General, Admin and fee)	Material and Acquisition Contracts	Miscellaneous and other Direct Costs	Total Cost
Administration	221	4,457	1,528		300	6,285
Personnel Training	55.4	931	349			1,280
Classroom Presentations	66.6	719	280		100	1,099
Restoration Activities	624	7,008	2,686	4,130	400	14,224

Total\$22,888

Budget Narrative

Funding is needed to support this riparian habitat restoration / education project in the following ways: to provide personnel to administer and coordinate the program, recruit and train staff, implement classroom presentations and restoration activities, maintain the some of the restoration projects through the first dry season, and evaluate the effectiveness of the projects. Personnel include the following: The Primary Investigator is Dr. Paul Maslin of the CSU, Chico Biology Department, who is donating his time. Emily Alma, Restoration Education Coordinator for Streaminders, will serve as Program Manager. Under the supervision of the Primary Investigator, she will oversee the project, recruit and train a Restoration Coordinator and student Group Leaders, work with the Primary Investigator and Restoration Coordinator to develop a specific planting plan for each restoration site, and take primary responsibility for the administrative requirements of the project. Jennifer Rotnem, Environmental Projects Coordinator for the CSU, Chico College of Natural Sciences, will serve as Assistant Program Manager, helping with the recruiting, fiscal and reporting responsibilities of the project. The Restoration Coordinator, under supervision of the Program Manager, will develop a restoration planting plan and classroom curriculum, recruit, train and schedule Group Leaders, contact classroom teachers, develop the schedule and oversee classroom, restoration and site maintenance activities. Group Leaders, under supervision of the Restoration Coordinator, will give classroom presentations and work with small groups of students on restoration and site maintenance field trips. The Group Leaders include two CSU, Chico students who will be hired for pay, two who will serve as interns for class credit, and two AmeriCorps workers for whom two thirds of their salary are paid by the AmeriCorps Watershed Project.

Operating expenses for the project include funding to purchase native plants, planting and irrigation supplies, office and curriculum supplies and expenses, film and film processing for site documentation and evaluation, and mileage for travel to schools and restoration sites

This project falls into four distinct phases, as illustrated above. It would be acceptable to receive funding in increments according to the phases.

Funding partnerships include the following: The City of Chico Parks Department, under direction of Dennis Beardsley, will provide assistance with restoration field trips on Big Chico Creek including providing access through locked gates, use of park tools and equipment, provision of wood chips for mulch, installing protective signs and helping to organize volunteers for site maintenance on restoration sites. The Watershed Project and the Center for Natural Lands Management, under supervision of Dr. Donald Holtgrieve, of the CSU, Chico Geography Department, will provide group leaders, native plants, irrigation and personnel for site maintenance for the two Butte Creek sites. Under the direction of Anna Kastner, the Feather River Hatchery, an agency of California Department of Fish and Game, will provide native plants, irrigation and personnel for site maintenance for the Hatchery restoration site. The AmeriCorps Watershed Project, under direction of Todd Haymer, will provide two thirds of the cost of trained workers to serve as Group Leaders. We are in the process of submitting a proposal to the local chapter of the California Native Plant Society for funding to purchase native plants.